Before the
FEDERAL COMMUNICATIONS COMMISSION

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In the Matter of:

Amendment of Parts 2 and 15 of the Commission's Rules Regarding Spread Spectrum Transmitters	**E.T. Docket No. 96-8**

RECEIVED 9/10/96

Digital Wireless Corporation respectfully submits these Reply Comments in response to the Commission's Notice of Proposed Rulemaking (NPRM), ET Docket No. 96-8, released February 5, 1996

1. Digital Wireless adamantly opposes the suggestion of Teletrac that no more than one half of a frequency hopper's hopset coincide with LMS frequencies if it uses fewer than 50 channels. This proposal is ludicrous and wasteful of perfectly good radio spectrum, a precious resource that seems in ever shorter supply. First, LMS systems are far from ubiquitous. FH systems certainly should not be restricted from using LMS frequencies where no LMS system exists. Secondly, no LMS system uses all of the LMS band. FH systems should not be excluded from using portions of the LMS allocations not used by the local system. Third, the transmissions of multilateration LMS systems occupy only a portion of the available frequency band for a relatively small percentage of the time. Using simple carrier sense circuitry and a little bit of smarts, a hopper can readily avoid interfering with or being jammed by an LMS system. We believe that Teletrac, with its 300-watt transmitters and 100-foot towers, is somewhat overwrought with respect to this issue. Digital Wireless submits that the prohibition sought by Teletrac is both

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unnecessary and undesirable, and asks that the Commission allow FH systems to operate throughout the 902-928 MHz band as they have been regardless of the number of hopping channels used.

2. Digital Wireless voices strong support for rules that would permit FH systems to coordinate their hopsets or adapt their hopsets to their RF environment. Our frequency-hopping WIT2400 transceiver operates on 80 channels with 1-MHz channel spacing in the 2450 MHz band. While it uses 1 MHz channel spacing, its 250 kilobit-per-second data stream is put onto a 400-kHz-wide transmit carrier, giving it significantly more range and better performance than is typically obtained from higher-speed, IEEE 802.11-compliant systems. We use the 1-MHz channel spacing for good adjacent channel rejection.

Like the 802.11-compliant systems, we utilize most of the available 83 MHz of bandwidth. Under current rules, the WIT2400 must transmit on at least 75 channels. If we encounter an interfering direct sequence system occupying, say, the lowest 25 MHz of the spectrum - not an unlikely scenario - we must transmit on at least 75 channels, transmitting on many of the jammed channels. This very likely will jam the other user. In addition, our throughput, which can be as high as 115 kilobits per second without significant interference, would fall down to less than 1/3 this value, or 38 kilobits per second. This is because time is wasted transmitting on the unusable channels, and the same data must then be retransmitted on another channel. In other words, the penalty for having to use bad channels is the throughput of twice the number of channels that are out. We respectfully request that the Commission include language to permit adaptive hopsets for interference avoidance, permitting hoppers to drop below the otherwise-required minimum number of hops if necessary to avoid collisions with other systems.

3. Digital Wireless supports a 3-dB reduction in transmit power for FH systems that use fewer than 50 hops. Permitting graded power output would be of limited value in

practice. While one dB is as good as another whether it comes from increased transmitter output, decreased receiver noise figure or wherever, link margin in the indoor/urban environment is dominated heavily by deep multipath fades with depths of 20 to 50 dB. One dB is not worth complicating the rules with a graded power formula.

4. Digital Wireless supports a transmit power reduction of 1 dB for every 3 dB of antenna gain above 6 dB at 5800 MHz. We are opposed to unlimited gain in any band, and we are opposed to allowing more than the current +6 dBW in the 915 and 2450 MHz bands. The 1dB/3dB provision at 5800 MHz provides for EIRPs of several hundred watts, and we feel that it will foster the development of that band as the point-to-point band. For a given antenna size, antenna beamwidth is narrowest at 5800 MHz, decreasing the likelihood of interference to other systems and minimizing the probability of interference to the point-to-point system. We do not believe that the 915 MHz and 2450 MHz bands can be shared by wireless LANs, cordless phones, LMS, and overpowered, high-gain point-to-point systems as well. We urge the Commission to reject the request of Western Multiplex, its 15 write-in customers notwithstanding, for unlimited antenna gain at 2450 MHz.

Digital Wireless would like to point out that Western Multiplex's Attachment 1, showing its point-to-point link being shut down by the in-band interference of a 1-watt wireless LAN that has the misfortune of locating right in its main beam is - to use a polite word - rubbish. Wireless LANS don't put out 1 watt at 2450 MHz. They generally operate at power levels of 50 to 80 mW so that they can comply with both US and ETSI rules. Western chose to show interference with the transmissions of a set conveniently located 40 kilometers away where its signals would be weakest. We could turn the tables and show a case where the point-to-point system operated with 40 dB link margin and shut out the wireless LAN. The fact of the matter is that frequency hoppers and direct sequence systems, regardless of their antenna configurations, never have gotten along much better than cats and dogs, respectively.

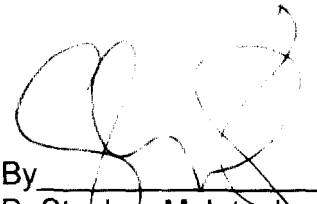
5. Lastly, we ask the Commission to reconsider the prohibition on "standard" antenna connectors contained in Part 15.203 with respect to equipment that is not offered for sale to the general public. The notion of "standard" is a moving target. At one time, an SMA microwave coaxial connector, which is at least 25 years old, was not considered "standard," presumably because it could generally be found only in RF development laboratories. The SMA connector was once allowed in OEM industrial radios like the ones we build. Then one day, SMA was standard and could no longer be used. We now must use an odd, sex-reversed SMA or permanently glue our right-angle antenna connector in place, not a very UPS-friendly configuration. We now use a microminiature coax connector from a German company that could not possibly be considered standard. But the other day, I saw an adapter from our obscure connector to SMA.

We understand that the Commission does not want people monkeying with the antennas of certified intentional radiators, and we have seen for ourselves the impact that changing antennas can have on spurious emissions. We submit, however, that applying the loosely-interpreted standard antenna connector rule to spread spectrum radios that are not offered for sale to the general public imposes an undue burden on manufacturers. The same person who has the SMA connectors has access to the obscure adapter that I mentioned above, and if he is bound and determined to interface our cigarette-pack-sized WIT2400 frequency-hopping radio to an 8-foot dish antenna, he is not going to be kept from the task by our having used a non-standard connector. I would agree that we should avoid using BNCs, Fs and other RadioShack items, but ask that the Commission delete the standard antenna provision for equipment not offered for sale to the general public or at least define "standard" more carefully in 15.203.

Conclusion

The spread spectrum revolution continues. We do not envy the Commission and its staff in the daunting task of wading though all these comments. We applaud the Commission's work in updating the rules, and look forward to reading of its decisions in the First Report and Order

Respectfully submitted,
Digital Wireless Corporation, Inc.



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